

ESA-131 Public Report

Introduction:

The Solutia facility located in Greenwood, SC has three major Nylon manufacturing operations. The key products consists on, Bulk Continuous Filament (BCF) which is used for Wear-Dated brand carpets, Nylon Industrial Yarns which are used for automotive products and Polymer flake which is sold to people who use the material to produce nylon yarns and molded products.

The plant began production on September 12, 1960 and has earned various recognitions on safety, quality management, etc.

Objective of ESA:

The main objective of the ESA was to target a specific area in the facility in which we could find some energy savings opportunities that could be modeled using the SSAT and 3E plus software tools.

Focus of Assessment:

Steam Systems and Personnel Training in DOE Steam System Tools

Approach for ESA:

Study of steam generation and targeted areas of high steam consumption. Training of Plant personnel in using DOE Steam System Tools.

General Observations of Potential Opportunities:

After the assessment, the following opportunities were identified:

a) Near Term Opportunities

- Change Boiler Efficiency – O₂% Reduction
The project involves the reduction of O₂% levels by 1%. The reduction is feasible due to the existing controls and new upgrades that will take place. Based on preliminary calculations, after the implementation of the project the plant will reduce fuel consumption by 0.5% (0.2% reduction on total utilities cost).
- Boiler Sequencing
The facility has 4 boilers which are operated based on steam demand. One of the boilers is base loaded and the rest are operated at very low loads. It is proposed to operate the boilers at higher loads by using sequencing controls for the boilers. Based on preliminary calculations, after the implementation of the project the plant will reduce fuel consumption by 0.8%.

b) Medium Term Opportunities

- Modify Feedwater Heat Recovery Exchanger using Boiler Blowdown
This project involves the installation of a Heat Exchanger to preheat makeup water using the heat from the blowdown at the boiler pressure. Based on preliminary calculations, after the implementation of the project the plant will reduce fuel consumption by 0.5% (0.3% reduction on total utilities cost).
- Change Boiler Efficiency – Economizer Installation
All 4 boilers are equipped with economizers; at this moment 3 of the economizers are not operational due to equipment failure. This project involves the repair and commissioning of these economizers. Based on preliminary calculations, after the implementation of the project the plant will reduce fuel consumption by 2.5% (1.3% reduction on total utilities cost).
- Flash Steam Heat Recovery
Along the plant there are various condensate receivers that are continuously venting steam to atmosphere. This project involves installation of vent condensers on these vents to recover the heat from the flash steam. Possible heat sinks are Feedwater preheat and water heating. Based on preliminary calculations, after the implementation of the project the plant will reduce fuel consumption by 1.3%.

c) Long Term Opportunities

- Change Condensate Recovery Rates
This project involves increasing condensate return by 10%. A higher increase will not be possible since there is a lot of steam injected into process that could not be returned. Part of this condensate is contaminated and two options might be considered, the first option being cleaning the condensate and returning it to the boiler house or recovering the heat from the contaminated condensate. Based on

preliminary calculations, after the implementation of the project the plant will reduce fuel consumption by 2.5% and 23.7% reduction on water cost (1.3% reduction on total utilities cost)

Management Support and Comments:

Energy Management department staff is aware of energy savings opportunities and always finding ways to improve efficiency of the system.

Best practices included but were not limited to:

- Waste process heat to preheat makeup water
- Utilization of VFDs on major motors
- Off gas Heat Recovery
- O₂ % trimming and controls on all boilers
- Excellent trap management program

Energy management department is currently evaluating small motors, upgrade of boiler controls and boiler sequencing and use of gas generated by landfill to supply the boilers.

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